

IN THE CLAIMS

1. (Currently amended) An arrangement for iterative channel impulse response estimation in a system employing a transmission channel, comprising:

a channel impulse response estimator for producing iteratively from a received signal (y) a channel impulse response estimate signal (\hat{p}); and

a noise estimator for producing from the received signal (y) iteratively at each iteration K an estimated vector of a noise estimate signal samples

$\hat{b}(K) = y - H \cdot \hat{p}(K-1)$, where H is a matrix depending on known symbols,

computing from the estimated vector of noise samples a vector of noise

covariance taps $r(K) = \text{win}_k \cdot \sum_{l=k}^{L_y-1} b_l(K) \cdot b_{l-k}^*(K)$ * where win_k is a windowing

function with a positive Fourier transform, and using the vector $r(K)$ to produce,

wherein said noise estimate signal comprises a new matrix $\{W\}W(K)$

representing the inverse of noise covariance, and

said channel impulse response estimator is arranged, at each iteration (K),

to respond to said new matrix $\{W\}W(K)$ representing the inverse of noise

covariance to produce a single improved channel impulse response estimate

$\hat{p}(K) = (H^H \cdot W(K) \cdot H)^{-1} \cdot H^H \cdot W(K) \cdot y$.

2. (Currently amended) The arrangement of claim 1 wherein said new matrix $\{W\}W(K)$ representing the inverse of noise covariance is calculated at each iteration.

3. (Currently amended) The arrangement of claim 1 wherein said new matrix $\{W\}W(K)$ representing the inverse of noise covariance is selected from predetermined values corresponding to statistics of expected noise.

4. (Cancelled)

5. (Currently amended) The arrangement of claim 4 ~~when dependent on claim 3~~ wherein the predetermined values corresponding to statistics of expected noise are selected according to the noise types: Gaussian, upper adjacent interferer, lower adjacent interferer, or co-channel interferer.
6. (Previously presented) The arrangement of claim 1 wherein the channel impulse response estimator is arranged to produce the channel impulse response estimate ~~signal~~ (\hat{p}) as a weighted least square function.
7. (Previously presented) The arrangement of claim 1 wherein the system is a wireless communication system.
8. (Previously presented) The arrangement of claim 7 wherein the system is a GSM system.
9. (Previously presented) The arrangement of claim 8 wherein the system is an EDGE system.
10. (Previously presented) A receiver for use in a system employing a transmission channel, the receiver comprising the arrangement of claim 1.
11. (Currently amended) A method, for iterative channel impulse response estimation in a system employing a transmission channel, comprising:
 - providing a channel impulse response estimator for producing iteratively from a received signal (y) a channel impulse response estimate ~~signal~~ (\hat{p}) ; and
 - providing a noise estimator for producing from the received signal (y) iteratively at each iteration K an estimated vector of a noise estimate signal samples $\hat{b}(K) = y - H \cdot \hat{p}(K - 1)$, where H is a matrix depending on known symbols, computing from the estimated vector of noise samples a vector of noise covariance taps $r(K) = win_k \cdot \sum_{l=k}^{L_y-1} b_l(K) \cdot b_{l-k}^*(K)$ where win_k is a windowing function with a positive Fourier transform, and using the vector $r(K)$ to produce,

wherein said noise estimate signal comprises a new matrix $\{\overset{W}{W}(K)\}$ representing the inverse of noise covariance, and
 said channel impulse response estimator, at each iteration (K), responds to said new matrix $\{\overset{W}{W}(K)\}$ representing the inverse of noise covariance to produce a single improved channel impulse response estimate ~~signal~~
 $\{\overset{\hat{P}}{\hat{P}}(K)\} = (H^H \cdot W(K) \cdot H)^{-1} \cdot H^H \cdot W(K) \cdot \underline{y}.$

12. (Currently amended) The method of claim 11 wherein said new matrix $\{\overset{W}{W}(K)\}$ representing the inverse of noise covariance is calculated at each iteration.

13. (Currently amended) The method of claim 11 wherein said new matrix $\{\overset{W}{W}(K)\}$ representing the inverse of noise covariance is selected from predetermined values corresponding to statistics of expected noise.

14. (Cancelled)

15. (Currently amended) The arrangement of claim 14 ~~when dependent on claim 13~~ wherein the predetermined values corresponding to statistics of expected noise are selected according to the noise types: Gaussian, upper adjacent interferer, lower adjacent interferer, or co-channel interferer.

16. (Previously presented) The method of claim 11 wherein the channel impulse response estimator produces the channel impulse response estimate ~~signal~~ $\{\overset{\hat{P}}{\hat{P}}(K)\}$ as a weighted least square function.

17. (Previously presented) The method of claim 11 wherein the system is a wireless communication system.

18. (Previously presented) The method of claim 17 wherein the system is a GSM system.

19. (Previously presented) The method of claim 17 wherein the system is an EDGE system.

20. (Currently amended) A computer readable medium embodying a computer program element, the computer program element comprising instructions for performing a method for iterative channel impulse response estimation in a system employing a transmission channel, the method comprising:

providing a channel impulse response estimator for producing iteratively from a received signal (y) a channel impulse response estimate ~~signal~~ (\hat{p}); and

providing a noise estimator for producing from the received signal (y) iteratively at each iteration K an estimated vector of noise samples

$\hat{b}(K) = y - H \cdot \hat{p}(K-1)$, where H is a matrix depending on known symbols,

computing from the estimated vector of noise samples a vector of noise

covariance taps $r(K) = \text{win}_k \cdot \sum_{l=k}^{L_y-1} b_l(K) \cdot b_{l-k}^*(K)$ where win_k is a windowing

function with a positive Fourier transform, and using the vector $r(K)$ to produce,

wherein said noise estimate signal comprises a new matrix $\{\frac{W}{W}\} W(K)$ representing the inverse of noise covariance, and

said channel impulse response estimator, at each iteration (K), responds to said new matrix $\{\frac{W}{W}\} W(K)$ representing the inverse of noise covariance to produce a single improved channel impulse response estimate ~~signal~~

$\{\frac{\hat{p}}{\hat{p}}\} \hat{p}(K) = (H^H \cdot W(K) \cdot H)^{-1} \cdot H^H \cdot W(K) \cdot y$.